

Appln. No.: 10/690,349
Amendment Dated June 22, 2007
Reply to Office Action of April 6, 2007

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Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Withdrawn) A composition for treating a metal surface to improve paint adhesion and corrosion resistance, said composition comprising water, an organo-functional silane, a compound of a group IV-B element, and a polymer blend having a plurality of carboxylic functional groups and a plurality of hydroxyl groups.
2. (Withdrawn) The composition of claim 1, wherein the ratio of equivalents of carboxylic functional groups to hydroxyl groups is between 0.3:1.0 and 3.5:1.0.
3. (Withdrawn) The composition of claim 1, wherein the weight ratio of silane to polymer blend is between 0.25:1 and 2.0:1.
4. (Withdrawn) The composition of claim 1, wherein the weight ratio of silane to polymer blend is between 0.5:1 and 1.0:1.
5. (Withdrawn) The composition of claim 1, wherein said organo-functional silane is selected from the group consisting of an aminopropyltriethoxy silane, a mercapto silane, and an epoxy silane.
6. (Withdrawn) The composition of claim 1, wherein said polymer blend comprises a first polymer having carboxylic functional groups and a second polymer having hydroxyl groups.
7. (Withdrawn) The composition of claim 6, wherein said first polymer is selected from the group consisting of polyacrylic acid and polymethylvinylether-co-maleic acid and said second polymer is polyvinyl alcohol.
8. (Withdrawn) The composition of claim 1, wherein said compound of a group IV-B element is an acid selected from the group consisting of fluozirconic acid, fluotitanic acid, and fluohafnic acid.
9. (Withdrawn) A composition for treating a metal surface to improve paint adhesion and corrosion resistance, said composition consisting essentially of water, an organo-functional

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silane, a compound of a group IV-B element, and a polymer blend having a plurality of carboxylic functional groups and a plurality of hydroxyl groups.

10. (Withdrawn) The composition of claim 9, wherein the ratio of equivalents of carboxylic functional groups to hydroxyl groups is between 0.3:1.0 and 3.5:1.0.

11. (Withdrawn) The composition of claim 9, wherein the weight ratio of silane to polymer blend is between 0.25:1 and 2.0:1.

12. (Withdrawn) The composition of claim 9, wherein the weight ratio of silane to polymer blend is between 0.5:1 and 1.0:1.

13. (Withdrawn) The composition of claim 9, wherein said organo-functional silane is selected from the group consisting of an aminopropyltriethoxy silane, a mercapto silane, and an epoxy silane.

14. (Withdrawn) The composition of claim 9, wherein said polymer blend comprises a first polymer having carboxylic functional groups and a second polymer having hydroxyl groups.

15. (Withdrawn) The composition of claim 14, wherein said first polymer is selected from the group consisting of polyacrylic acid and polymethylvinylether-co-maleic acid and said second polymer is polyvinyl alcohol.

16. (Withdrawn) The composition of claim 9, wherein said compound of a group IV-B element is an acid selected from the group consisting of fluozirconic acid, fluotitanic acid, and fluohafnic acid.

17. (Currently Amended) A method for treating a metal surface to improve paint adhesion and corrosion resistance comprising contacting the metal surface with a composition comprising water, an organo-functional silane, a compound of a group IV-B element, and a polymer blend having a plurality of carboxylic functional groups and a plurality of hydroxyl groups, wherein the metal surface is selected from the group consisting of aluminum, iron, zinc, and alloys of any of these.

18. (Original) The method of claim 17, wherein the ratio of equivalents of carboxylic functional groups to hydroxyl groups is between 0.3:1.0 and 3.5:1.0.

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19. (Original) The method of claim 17, wherein the weight ratio of silane to polymer blend is between 0.25:1 and 2.0:1.

20. (Original) The method of claim 17, wherein the weight ratio of silane to polymer blend is between 0.5:1 and 1.0:1.

21. (Original) The method of claim 19, wherein the organo-functional silane is selected from the group consisting of an aminopropyltriethoxy silane, a mercapto silane, and an epoxy silane.

22. (Original) The method of claim 17, wherein said polymer blend comprises a first polymer having carboxylic functional groups and a second polymer having hydroxyl groups.

23. (Original) The method of claim 22, wherein said first polymer is selected from the group consisting of polyacrylic acid and polymethylvinylether-co-maleic acid and said second polymer is polyvinyl alcohol.

24. (Original) The method of claim 9, wherein said compound of a group IV-B element is an acid selected from the group consisting of fluozirconic acid, fluotitanic acid, and fluohafnic acid.

25. (Original) The method of claim 17, wherein the metal surface is an aluminum surface.

26. (Currently Amended) A method for treating a metal surface to improve paint adhesion and corrosion resistance comprising the steps of:

cleaning the metal surface to form a cleaned metal;

rinsing the cleaned metal with water to form a rinsed metal; and

contacting the rinsed metal with a composition comprising water, an organo-functional silane, a compound of a group IV-B element, and a polymer blend having a plurality of carboxylic functional groups and a plurality of hydroxyl groups, wherein the metal surface is selected from the group consisting of aluminum, iron, zinc, and alloys of any of these.

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27. (Original) The method of claim 26 further comprising, after the contacting step, the steps of:

drying the metal surface; and

then painting the metal surface with an acrylic paint.

28. (Original) The method of claim 27, wherein the acrylic paint comprises titanium dioxide, normal butyl alcohol, xylene, heavy aromatic solvent naphtha, diacetone alcohol, a ketone mixture, light aromatic solvent naphtha, one or more film formers, and one or more resins.

29. (Original) The method of claim 26, wherein the cleaning step comprises contacting the metal surface with an alkaline cleaner.

30. (Original) The method of claim 29, wherein the alkaline cleaner comprises potassium hydroxide, gluconic acid, and either tetrasodium ethylenediaminetetraacetate or a combination of potassium silicate and sodium tri polyphosphate.